CARDIOVASCULAR, PHARMACOLOGY, CHEMISTRY

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Activated - 8/1/61

TOBACCO INDUSTRY RESEARCH COMMITTEE
150 East Forty Second Street
New York 17, New York

Committee:
Dr. Jacobson, Chm.
Dr. Bing
Dr. Cattell

APPLICATION FOR RESEARCH GRANT (RENEWAL)

Date: May 1, 1962

1. Name of Investigators: ROBERT A. KUHN, M. D.
HERMANN KUGLER, M. D.

2. Title: Associate Professor

3. Institution & Address: R. A. KUHN, M. D., - Department of Neurosurgery,
New York Medical College
Fifth Avenue at 105th Street
New York, New York
Division of Neurosurgery, All Souls Hospital,
Mt. Kemble Avenue, Morristown, New Jersey

HERMANN KUGLER, M. D., - Resident in Neurology
Metropolitan Hospital
New York, New York.

4. Project or Subject: "EFFECT OF TOBACCO UPON CEREBRAL CIRCULATION"

5. Detailed Plan of Procedure:

During the past year, under the auspices of the Tobacco Industry Research Committee, a definitive work has been accomplished in setting normal standards for velocity of blood flow through the human brain. Knowledge of these basic values was essential before any attempt could be made to study variants, whether developmental or environmental.

A new research tool perfected by the chief investigator, was used to study blood flow-cerebral angiography performed in such manner as to result in physiological flow of contrast media. When this technique is combined with high speed film-shuttling, a permanent record is obtained of all phases of neck and brain circulation. A color, sound movie demonstrating the method, and its remarkable potential for investigation of cerebral blood flow, is to be presented together with a static exhibit of the technique at the A.M.A. annual meeting in June, 1962. This movie incorporates a brief, and relatively crude initial effort to display the circulation in cine fashion.

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Measurement of the phases of cervical-cerebral flow has been accomplished during the past year by study of consecutive individual, 14 x 14" cut-films, exposed at a speed of six films per second for five seconds. During this investigation it became apparent that moving picture sequences and slow motion display of the cerebral capillary phase - or any other selected phase - was feasible. The angiographic method made it possible to position the patient so that each film could be precisely superimposed upon the next - and a new method of photographing X-rays has yielded positive prints of exceptional quality.

It is planned to combine these techniques in the coming year to construct film strips, in slow motion of the important capillary phase of brain circulation. These strips can then be analyzed for differences in consecutive studies of the same patient, and between different patients. The effects of tobacco smoke inhalation, if any, can be objectively evaluated. The film strips will be combined into a movie which, it is believed, will receive wide dissemination as the first teaching film on phases of cerebral circulation. If these ends are accomplished, and there seems every reason to believe they are attainable, results should constitute an important milestone in modern knowledge of cerebral hemodynamics.

6. Budget Plan:

a.	Salaries *	$18,000.00
b.	Expendable Supplies *	4,000.00
c.	Permanent Equipment *	2,200.00
d.	Overhead (15% of a,b,e)	3,420.00
e.	Other	800.00
	TOTAL	$28,420.00

a. *SALARIES - R. A. Kuhn, M. D. - Considerable success has attended initial efforts to define phases of cerebral circulation, and in particular to determine for the first time normal values of blood flow velocities in the human brain. Following research lines in the direction outlined in the original application to the T.I.R.C., it is the hope of the principal investigator to expand these data by devoting additional time withdrawn from the private practises of neurology and neurosurgery. The amount requested will enable the exercise of considerable freedom in attaining research objectives.

H. Kugler, M. D. - Continuation and expansion of services as previously rendered. Dr. Kugler will, in addition, be responsible for workup of clinic patients, and assembling pertinent data for each of their records. Dr. Kugler performs a particularly valuable service because of his multilingual abilities, and excellence as a library research worker. He has access to all facilities of the New York Academy of Medicine.

b. *EXPENDABLE SUPPLIES - During recent preparation of a teaching film, shortly to be generally released, and entitled "A New Diagnostic Technique for Strokes: Retrograde Brachial Angiography", it became apparent that moving picture sequences of opaque media passing through the brain could be accurately constructed and displayed by making composites of individual prints of the six-per-second cut-film X-rays. This process has not previously been utilized,

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b- cont'd - and offers excellent opportunity for slow motion study of the capillary phase of cerebral circulation. In addition, it will be used extensively for analysis of other phases of cerebral circulation. The process of creating these movies is somewhat laborious, for a positive print must be made of each of thirty films, and then each print photographed and reprinted. It is planned to combine film strips from different patients into a movie demonstrating discrete phases of cerebral circulation.

c. *PERMANENT EQUIPMENT - An automatic injector (Cordis) will enable rapid, controlled injection of variable amounts of contrast medium, accurately timed to the x-ray apparatus. It will therefore perform the vital function of removing the angiographer from otherwise cumulative exposures to radiation. It will also help provide a standard set of angiograms, since identical times can be programmed for the injection in each patient.

7. Anticipated Duration of Work: ONE YEAR. It is planned to present results of this research at the American Neurological Association meeting in 1963.

8. Facilities and Staff Available:

Studies will be concentrated in the All Souls Hospital, Division of Neurosurgery. This division is under the direction of Dr. Kuhn. The previous full cooperation of the Administration of All Souls Hospital assures continued access to clinic as well as private patients - and will provide access in an investigative atmosphere difficult to create in an institution hampered by a multitude of municipal rules and regulations.

Comparison films of patients at Metropolitan Hospital, New York City, will be available to serve as controls. Although these studies will be performed on slower angiographic equipment, speeds are sufficiently great to allow valid comparisons.

9. Additional Requirements: A supplementary amount may be requested during the year for cost of reprints of papers published as work progresses.

10. Additional Information (including relation of work to other projects and other sources of supply)

Other sources of supply - NONE

Certain of the subjects included in this study will constitute part of an evaluation program of stroke patients being conducted privately by the principal investigator. Also, some films used in the control series will be those of patients in a cerebrovascular disease program, and under investigation by the neurology and neurosurgical services of New York Medical College.

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Signature ROBERT A. KUHN, M. D.
Director of Project

SISTER MARY ELEANOR - Administrator
Business Officer of the Institution

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